UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,741	01/31/2006	Giorgio Macor	11/2-22935/A/PCT	9743

324 7590 04/15/2010

BASF Performance Products LLC
Patent Department
540 White Plains Road
P.O. Box 2005
Tarrytown, NY 10591

EXAMINER	
HORNING, JOEL G	

ART UNIT	PAPER NUMBER
1712	

NOTIFICATION DATE	DELIVERY MODE
04/15/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

andrea.dececchis@basf.com
deborah.pinori@basf.com
sonny.nkansa@basf.com

Office Action Summary	Application No.	Applicant(s)	
	10/566,741	MACOR ET AL.	
	Examiner	Art Unit	
	JOEL G. HORNING	1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 January 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15 and 19-21* is/are pending in the application.

4a) Of the above claim(s) *19 and 20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *05-01-06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. By amendment filed December 7th, 2009 , Claims 1 and 2 have been amended. Claims 1-15 and 19-21 are currently pending.

Election/Restrictions

2. Claims 19 and 20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 06-10-2009.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. **Claims 1-6, 8-13, 15 and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bauer et al (US 6548121) in view of Affinito (US 20040011288) in view of Borden et al (US 4233130).

The instant claim 1 is directed towards a process for the production of a strongly adherent metal coating on a ***glass, ceramic or polymeric substrate***, wherein:

a. A low temperature plasma treatment, a corona discharge treatment or a flame treatment is carried out on the substrate;
b. One or more photoinitiators containing at least one ethylenically unsaturated group are applied to the substrate. ***This layer is optionally dried***;
c. The layer of step b is irradiated with electromagnetic waves **with wavelengths between 150 to 700nm and with a dosage of 1 to 1000 mJ/cm^2**; and **after said irradiation,**
d. On such a photoinitator coated substrate, a metal, half-metal or metal oxide is deposited from the gas phase. ***This produces a substrate which is affixed to the irradiated layer, which is in turn affixed to a deposited metal, half-metal or metal oxide layer.***

It is noted that the step "b" drying step is optional. Since the step is optional it is not required for the claim language to be met.

'121 teaches a process for producing strongly adhering coatings on substrates, such as polymers. This method used varies depending upon what kind of layer is being deposited. The general process can occur under vacuum

conditions and comprises: a low temperature plasma treatment is carried out on the substrate; one or more photoinitiators containing at least one ethylenically unsaturated group are applied to the substrate, and on such a photoinitator coated substrate, a layer is deposited. If a polymeric layer is desired, a composition including at least one ethylenically unsaturated monomer or oligomer [and preferably a photoinitiator, as seen in col 17, lines 49-55] is coated on the substrate and cured by UV/VIS radiation [which '121 further teaches is to be considered between 250 nm and 450 nm **(claim 15)**, col 17, lines 52-55]. If a metal, half-metal or metal oxide is desired, that layer is deposited from the gas phase *while* the substrate is being irradiated with electromagnetic waves (col 1, line 50 through col 2, line 12). '121 does not teach repeating these steps to deposit first a polymeric layer and then a metallic layer.

However, Affinito is also directed towards a vacuum process for depositing monomer coatings on substrates and then polymerizing them [0002], such as by UV radiation [0019]. It also teaches that such coatings are useful for a wide variety of applications on a wide variety of substrates, including polymeric ones [0004]. It further teaches that in some of these applications, it is desirable to deposit more than one layer onto the substrate, specifically, depositing a polymeric layer (by depositing a monomer layer and crosslinking it) and then depositing a metal layer onto that polymeric layer [0047-0048], such as in the process of making electrochemical cells, where the monomer layer is deposited, crosslinked and then coated with the metal layer [0059].

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention performing the process of Bauer et al to first deposit a polymeric layer and then to deposit a metallic layer, since it was taught to be a useful combination of layers for a variety of applications, which would produce predictable results. In doing so, a person of ordinary skill in the art would perform a process that *comprises*: a low temperature plasma treatment to the polymeric substrate (step "a"), depositing a photoinitiator sub-layer and a mixture of photoinitiators with monomers containing at least one ethylenically unsaturated group, to produce a sub-layer, producing an organic layer (step "b"), irradiating that organic layer to produce a polymeric layer (step "c") and depositing from the gas phase a metal layer (step "d"), so that the substrate is affixed to the irradiated polymeric layer which is affixed to the metal layer.

Furthermore,'121 does not teach what dosage of radiation should be used to cure their polymers.

However, Borden et al is also directed towards curing polymer composition coatings containing photosensitizers (abstract), it teaches that the radiation dosage used to suitably cure such coatings is a result effective variable for determining the degree of crosslinking required in the layer and will vary depending upon the polymer composition used. Since it teaches the dosage per gram of polymer composition, it is readily apparent that the thickness of the coating would also be variable when the dosage is represented as millijoules per centimeter squared (col 5, lines 57-66). Thus, it would have been obvious to one of ordinary skill in the art at

the time of invention to choose the instantly claimed ranges of "1 to 1000 mJ/cm^2" through process optimization to produce the desired degree of crosslinking for a particular polymer composition deposited in a particular thickness, since it has been held that when the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980) **(claim 1)**.

4. Regarding **claim 2**, as mentioned previously '121 teaches performing an irradiation during the metal deposition from the gas phase through (col 2, lines 9-12).
5. Regarding **claims 3-6**, '121 teaches many different photoinitiators. The photoinitiator can be benzophenones **(claim 3)** (col 17, lines 49-67). The photoinitiator is preferably a subset of the formulas of **claim 4** (col 6 line 61 through col 7, line 8). In which (IN) is further preferably limited by a subset of the formulas of **claim 5** (col 7, line 9 through col 8, line 4). In which (RG) and (RG') are further especially preferably limited by a subset of the formulas of **claim 6** (col 8, line 65 through col 9, line 10). Additionally, example 1 teaches using a photoinitiator which meets the limitations of **claims 4 and 5** (col 23, lines 29-40).
6. Regarding **claim 8, 9 and 21**, '121 teaches an example 1 which exposes the substrate to plasma formed from a mixture of argon (inert) and oxygen (reactive) **(claims 8, 9 and 21).**
7. Regarding **claim 10**, '121 does not teach appropriate thickness ranges for their photosensitizer containing polymer layers. However, Affinito teaches that in such

vacuum deposition methods thicknesses of 5-10000nm can be suitable thicknesses [0051].

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to deposit photosensitizer containing layers 5-10000nm in thickness, since they were taught to be suitable thicknesses for polymer layers to be deposited on such substrates. MPEP 2144.05 states: “In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists.” **(claim 10)**.

8. Regarding **claim 11,** '121 teaches performing the application of the photoinitiator (step “b”) as soon as possible after the corona discharge treatment (process step “a”) and suggests doing so in a continuous process (col 15, lines 15-20). Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to perform step “b” immediately after step “a.”
9. Regarding **claim 12**, ‘121 teaches that the photoinitators can be used in combination with a solvent (col 15, lines 7-27), so materials other than photoinitiators are taught to be present in the composition. MPEP 2144.05 (II) states: "Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. '[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.'"

10. Regarding **claim 13**, '121 teaches that the process allows a high throughput per unit time (col 1, lines 50-51). The examiner takes official notice that waiting time between process steps is a well known variable for determining the maximum throughput per unit time of a process. Decreasing the waiting times between processing steps, decreases the total time for the overall process and increases the maximum throughput of a process.

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to reduce the waiting times as much as possible and perform step "c" immediately after step "b" in order to allow for a higher throughput per unit of time as taught to be desirable by '121.

11. **Claims 7 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bauer et al (US 6548121) in view of Affinito (US 20040011288) in view of Borden et al (US 4233130), as applied to claim 1 above, and further in view of Kohler et al (US 6251963).

'121 teaches that the photoinitators can be used in combination with a solvent (col 15, lines 7-27), but does not teach that the solvent is a liquid or what should be done with the solvent after the photoinitiator layer is deposited.

However, '963 is also directed towards depositing films of photoinitiators and teaches using liquid solvents with the photoinitiators in order to form a solution which is then deposited on the substrate (col 18, lines 31-48).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to choose to use a liquid solvent with the photoinitiator

compositions containing a solvent of '121 as a known manufacturing option for depositing a film of a photoinitiator composition, which would produce predictable results **(claim 7)**.

12. Regarding **claim 14**, '963 teaches that after the substrate is coated with the liquid solution photoinitiator, the solvents are normally removed by drying (col 19, lines 29-31).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to then dry the liquid solution after the layer has been deposited since it was recognized to be the normal procedure for such liquid solvent bearing coatings.

'963 further teaches drying the photoinitiator film at elevated temperatures (col 25, lines 51-52) and that it is advantageous to dry photoinitiators at elevated temperatures under a vacuum (col 4, lines 39-42). The use of a reduced pressure environment with the heating step would require that the coating be heated inside a vacuum chamber, which would be, by definition, an oven.

Thus it would have further been obvious to a person of ordinary skill in the art at the time of invention to dry the photoinitator coating at elevated temperatures under a vacuum in an oven, since it was known to the art to be an advantageous method for drying photoinitiators and would produce predictable results **(claim 14)**.

Response to Arguments

13. Applicant's arguments filed January 8th, 2010 have been fully considered but they are not convincing in view of the new rejection necessitated by amendment.

Conclusion

14. No current claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOEL G. HORNING whose telephone number is (571) 270-5357. The examiner can normally be reached on M-F 9-5pm with alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael B. Cleveland can be reached on (571)272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. G. H./
Examiner, Art Unit 1712

/Michael Cleveland/
Supervisory Patent Examiner, Art Unit 1712